LWG
LOWER WILLAMETTE GROUP

PORTLAND HARBOR RI/FS

BACKGROUND DOCUMENT: WEIGHT TO BE GIVEN TO ATTAINING MCLS IN PORTLAND HARBOR

--FOR DISCUSSION

DRAFT

DO NOT QUOTE OR CITE
This document is for discussion purposes only and is subject to change in whole or part.

August 21, 2008

ISSUE FOR DISCUSSION:

WEIGHT TO BE GIVEN TO ATTAINING MCLs IN PORTLAND HARBOR

- EPA guidance requires that the chosen remedy must protect against unreasonable risks, which requires an assessment of whether the exposure scenarios that are evaluated will actually occur.
    - Tab 1: Excerpt, EPA OSWER Directive 9355.0-30
    - Tab 2: Excerpt, Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, December, 2005
- Residential water supply is not a likely potential future scenario for the Willamette River Portland Harbor surface water. That is, a drinking water scenario is not likely to occur.
    - Tab 3: Excerpts, City of Portland, Oregon, Water Management and Conservation Plan, Final Draft Report, March 2008
- Even if the Portland Harbor section of the Willamette River were to be used for residential water supply, which is not likely, this would have to be after adequate pretreatment that meets Safe Drinking Water Act (SWDA) standards and Oregon rules. The State's beneficial use designations for the Willamette Basin indicate (as they do for other basins), that any use for drinking water would be after such pretreatment.
    - Tab 4: OAR 340-041-0340, Table 340A
    - Tab 5: Memorandum: Application of Oregon Administrative Rule 340-041-0340
- The State has previously interpreted an identical beneficial use designation for the Snake River Basin, in a TMDL approved by EPA. It determined that the beneficial use designation did not mean that MCLs needed to be met in-stream, but rather that the in-stream waters must be of sufficient quality that it is possible for them to meet drinking water standards with conventional treatment methods.
    - Tab 6: OAR 340-041-0340, Table 121A (Designated Beneficial Uses Mainstem Snake River) (compare to Tab 5)
    - Tab 7: Excerpt, Snake River – Helis Canyon TMDL, Submitted - July 2003, Revised – June 2004

- The SWDA itself would not require meeting MCLs in the river because EPA SWDA rules clearly state that surface water MCLs are applied tap side after treatment.
    - Tab 8: Excerpts, National Primary Drinking Water Regulations 40 CFR Part 141
- Pretreatment of Willamette River water currently occurs at the City of Wilsonville Willamette River Treatment Plant. That system provides an indication of "adequate pretreatment."
    - Tab 9: Memorandum: City of Wilsonville Willamette River Water Treatment Plant
- We have inquired and have not learned of any urban river system in the country where MCLs have been applied directly to the surface water either as ARARs or as a cleanup level.
    - Tab 10: Memorandum from Laura Kennedy investigating Relevance and Appropriateness of MCLs at other EPA sediment sites

Tab 1

Excerpt, EPA OSWER Directive 9355.0-30

"…both current and reasonably likely future risks need to be considered in order to demonstrate that a site does not present an unacceptable risk to human health and the environment. An adequate consideration of future risk may necessitate the assessment of risks assuming a land use different from that which currently exists at the site. The potential land use associated with the highest level of exposure and risk that can reasonably be expected to occur should be addressed in the baseline risk assessment.... When exposures based on reasonable future land uses are used to estimate the risk, the NCP preamble states that the ROD "should include a qualitative assessment of the likelihood that the assumed future land use will occur.""

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

APR 22 1991

OSWER DIRECTIVE 9355.0-30

MEMORANDUM

SUBJECT: Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions

FROM: Don R. Clay
Assistant Administrator

TO: Directors, Waste Management Division
Regions I, IV, V, VII, VIII
Director, Emergency and Remedial Response Division
Region II
Directors, Hazardous Waste Management Division
Regions III, VI, IX
Director, Hazardous Waste Division,
Region X

Purpose

The purpose of this memorandum is to clarify the role of the baseline risk assessment in developing Superfund remedial alternatives and supporting risk management decisions.

Specifically, the following points are made in the memorandum:

- Where the cumulative carcinogenic site risk to an individual based on reasonable maximum exposure for both current and future land use is less than 10(-4) and the non-carcinogenic hazard quotient is less than 1, action generally is not warranted unless there are adverse environmental impacts. However, if MCLs or non-zero MCLGs are exceeded, action generally is warranted.

- Other chemical-specific ARARs may also be used to determine whether a site warrants remediation.

specific risk estimate around 10(-4) may be considered acceptable if justified based on site-specific conditions, including any remaining uncertainties on the nature and extent of contamination and associated risks. Therefore, in certain cases EPA may consider risk estimates slightly greater than 1 x 10(-4) to be protective.

When an ARAR for a specific chemical (or in some cases a group of chemicals) defines an acceptable level of exposure, compliance with the ARAR will generally be considered protective even if it is outside the risk range (unless there are extenuating circumstances such as exposure to multiple contaminants or pathways of exposure). Conversely, in certain situations EPA may determine that risks less than 1 x 10(-4) are not sufficiently protective and warrant remedial action.

Where current conditions have not resulted in a release posing risks that warrant action but there is a significant possibility that a release will occur that is likely to result in an unacceptable risk, remedial action may also be taken. The significance of the potential future release may be evaluated in part based on the quantities of material at the site and the environmental setting.

RISKS CONSIDERED IN RISK MANAGEMENT DECISION

As noted above, both current and reasonably likely future risks need to be considered in order to demonstrate that a site does not present an unacceptable risk to human health and the environment. An adequate consideration of future risk may necessitate the assessment of risks assuming a land use different from that which currently exists at the site. The potential land use associated with the highest level of exposure and risk that can reasonably be expected to occur should be addressed in the baseline risk assessment. Further, this land use and these exposure assumptions should be used in developing remediation goals.

The preamble to the NCP states that EPA will consider future land use as residential in many cases. In general, residential areas should be assumed to remain residential; and undeveloped areas can be assumed to be residential in the future unless sites are in areas where residential land use is unreasonable. Often the exposure scenarios based on potential future residential land use provide the greatest risk estimates (e.g., reasonable maximum exposure scenario) and are important considerations in deciding whether to take action (55 Fed. Reg. at 8710).

However, the NCP also states that "the assumption of future residential land use may not be justifiable if the probability

that the site will support residential use in the future is small. "Sites that are surrounded by operating industrial facilities can be assumed to remain as industrial area unless there is an indication that this is not appropriate. Other land uses, such as recreational or agricultural, may be used, if appropriate. When exposures based on reasonable future land use are used to estimate risk, the NCP preamble states that the ROD "should include a qualitative assessment of the likelihood that the assumed future land use will occur" (55 Fed. Reg. at 8710).

Unacceptable environmental risks also may prompt remedial action and may occur where there is no significant risk to human health. Threats or potential threats to sensitive habitats, such as wetlands, and critical habitats of species protected under the Endangered Species Acts are especially important to consider when determining whether to take an action under CERCLA Section 104 or 106. Ambient Water Quality Criteria for aquatic organisms are chemical-specific standards that will generally be considered when determining whether to take an action based on the environmental risk of releases to surface waters.

NO-ACTION DECISIONS

If the baseline risk assessment and the comparison of exposure concentrations to chemical-specific standards indicates that there is no unacceptable risk to human health or the environment and that no remedial action is warranted, then the CERCLA Section 121 cleanup standards for selection of a Superfund remedy, including the requirement to meet applicable or relevant and appropriate requirements (ARARs), are not triggered. CERCLA section 121 (a) requires only that those remedial actions that are "determined to be necessary ... Under section 104 or ... 106 ... be selected in accordance with section 121." If EPA determines that an action is necessary, the remedial action must attain ARARs, unless a waiver is invoked. Of course, sites that do not warrant action under CERCLA sections 104 or 106 may warrant action under another State or Federal statute, such as RCRA subtitle D requirements for the appropriate closure of a solid waste landfill.

The decision not to take action at an NPL site under section 104 and 106 should also be documented in a ROD. The decision documentation process should include the preparation of a proposed plan for public comment, ROD and eventually a closeout report and Federal Register deletion notice.

POINT OF DEPARTURE WHEN ACTION WARRANTED

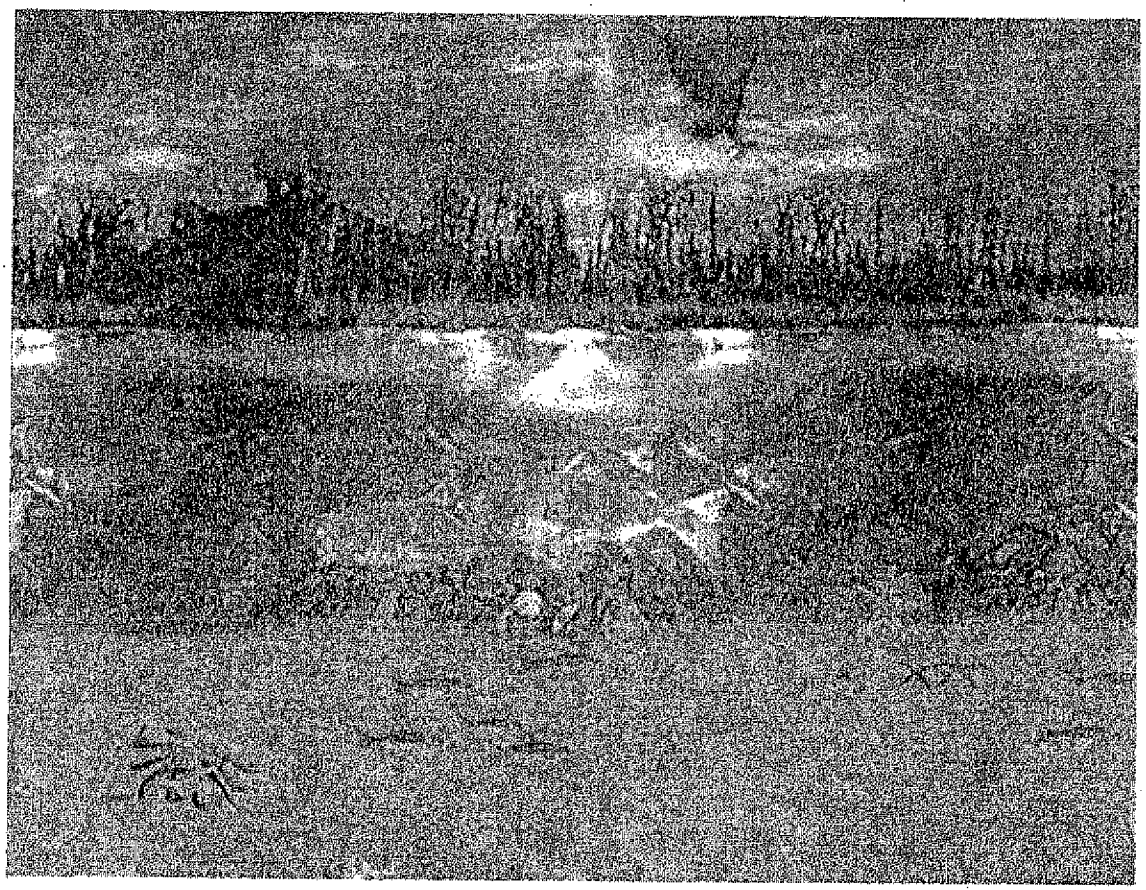
Once remedial action has been determined to be warranted,

Tab 2

Excerpt, Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, December, 2005

"Uncertainty factors that may be relevant to consider include (among others) the reliability of inputs and outputs of any model used to estimate risks and establish cleanup levels, reliability of the potential approaches to achieve those results, and the likelihood of occurrence for the exposure scenarios being considered." (Page 2-17)

Contaminated Sediment Remediation Guidance for Hazardous Waste Sites



reduction of toxicity, mobility and volume through treatment; short-term effectiveness; implementability; cost; and state and community acceptance. Chapter 3, Section 3.2, NCP Remedy Selection Criteria discusses these criterion in detail. Regions should note, however, that some states do have chemical and/or biological standards for contaminated sediment (e.g., in development by the State of Washington and others) that may be ARARs at sediment sites.

Uncertainty factors that may be relevant to consider include (among others) the reliability of inputs and outputs of any model used to estimate risks and establish cleanup levels, reliability of the potential approaches to achieve those results, and the likelihood of occurrence for the exposure scenarios being considered. Other technical factors include (among others) limitations of remedial alternatives and detection and quantification limits of contaminants in environmental media. It is especially important to consider both background levels of contamination and what has been achieved at similar sites elsewhere, so that achievable cleanup levels are developed. All of these factors should be considered when establishing final cleanup levels that are within the risk range.

The derivation of ecologically based cleanup levels is a complex and interactive process incorporating contaminant fate and transport processes, toxicological considerations and potential habitat impacts of the remediation alternatives. Before selecting a cleanup level, the project manager, in consultation with the ecological risk assessor, should consider at least the following factors (U.S. EPA 1999b):

- The magnitude of the observed or expected effects of site releases and the level of biological organization affected (e.g., individual, local population, or community);
- The likelihood that these effects will occur or continue;
- The ecological relationship of the affected area to the surrounding habitat;
- Whether the affected area is a highly sensitive or ecologically unique environment; and
- The recovery potential of the affected ecological receptors and expected persistence of the chemicals of concern under present site conditions.

Generally, for CERCLA actions, the ROD should include chemical-specific cleanup levels as provided in the NCP at 40 CFR §300.430(e)(2)(I)(A). The ROD should also indicate the approach that will be used to measure attainment of the cleanup levels and how cleanup levels relate to risk reduction. At many sediment sites, especially but not exclusively those with bioaccumulative contaminants, the attainment of sediment cleanup levels may not coincide with the attainment of RAOs. For example, this may be due to the length of time needed for fish or the benthic community to recover. Where cleanup levels have been achieved but progress towards meeting RAOs is not as expected, the five-year review process, or where appropriate, a similar process conducted before five years, should be used to assess whether additional actions are needed. Consistent with the NCP (40 CFR §300.430(f)(4)(ii)), where contaminants remain present above unlimited use and unrestricted exposure levels, Superfund sites should be reviewed no less than every five years after initiation of the selected remedial action. Chapter 8, Remedial Action and Long-Term Monitoring, provides additional guidance on the information that should be collected for this review to be effective. As explained further in Chapter 8, the need for long-term monitoring is not limited to sites where five-year reviews are required. Most sites where

Tab 3

Excerpts, City of Portland, Oregon, Water Management and Conservation Plan, Final Draft Report, March 2008

"The primary drinking water source for Portland is the Bull Run watershed, supplemented by a groundwater supply from the Columbia South Shore Well Field (CSSWF) and potentially by wells in the former Powell Valley Road Water District (PVRWD)...." (Executive Summary, page iii)

... "The development of four existing groundwater rights in the CCSWF would best leverage the existing infrastructure and subsurface hydrology, would create the least environmental impacts, and would meet the vulnerability needs making it the most cost effective and responsible option.... For these reasons, continuing to use the groundwater system as backup supply and developing the conservation programs are the methods of choice for meeting future needs." (Executive Summary, page xvii)

"5.5.3 Summary and Conclusions Regarding Alternative Sources

"* * *

"Water sources not within the control of the City of Portland such as Columbia, Willamette, and Clackamas Rivers have also been evaluated. These sources are not considered viable sources to meet either reliability needs or growth needs for summer supplies for reasons of cost, water quality, or availability. * * *" (Section 5.5, Alternative Sources Analysis.)

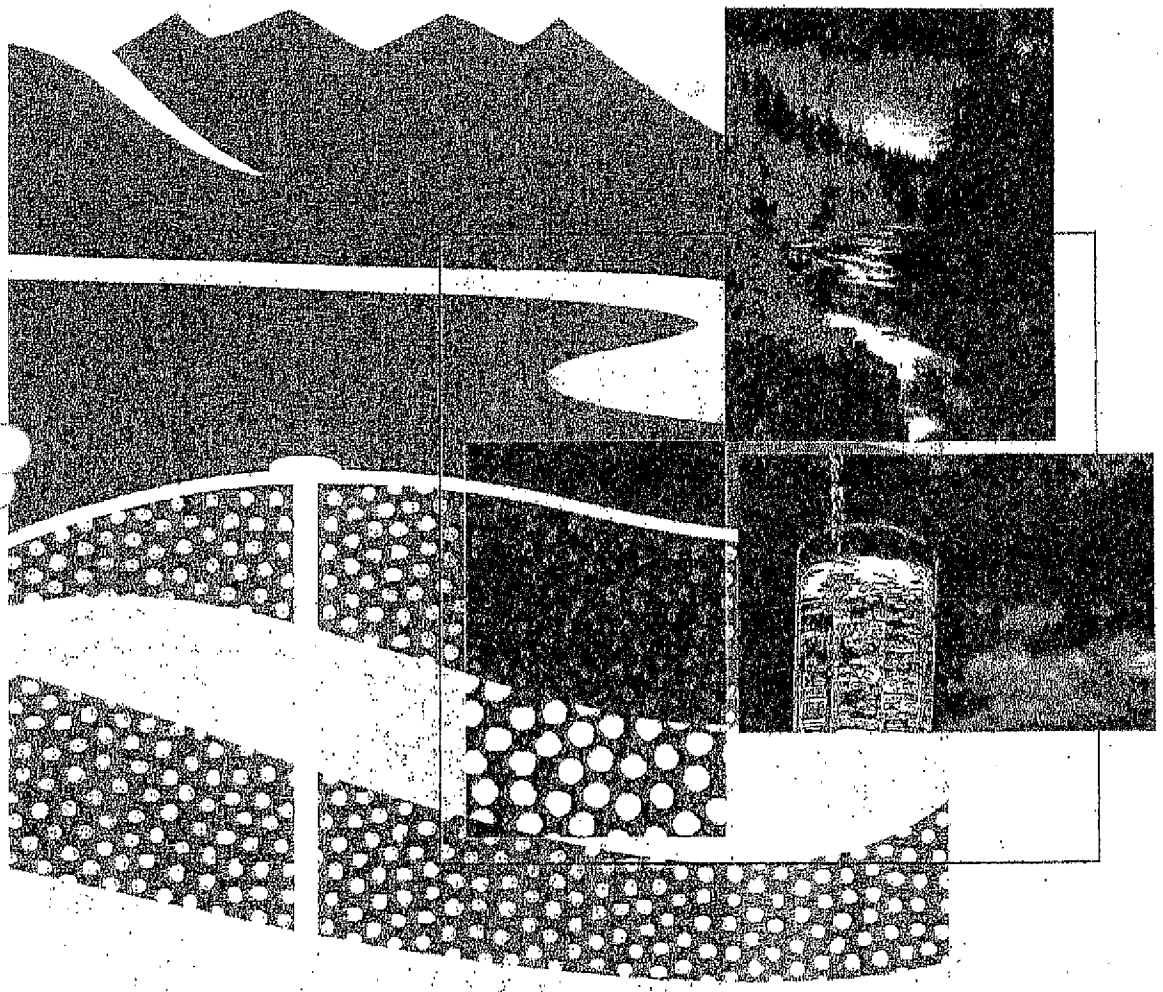
Note: The excerpts are in the context of evaluating future demand based on forecasts through 2030. (Executive Summary, page xii.)

CITY OF PORTLAND, OREGON

Water Management and Conservation Plan

FINAL DRAFT REPORT

MARCH 2008



PORTLAND WATER BUREAU

FROM FOREST TO FAUCET

1120 S.W. Fifth Avenue, Room 600
Portland, Oregon 97204

Executive Summary

Municipal Water Supplier Description

Approximately 860,000 people living within a 225-square-mile service area around Portland are served by the Water Bureau's retail and wholesale water system. The Water Bureau delivered 36 billion gallons (BG) to customers during fiscal year (FY) 2006-2007. The bureau's 19 wholesale water customers are mostly contiguous to the retail service area and serve parts of Multnomah, Clackamas, and Washington counties. In FY 2006-2007, the Water Bureau supplied approximately 60 percent of its water to retail accounts and approximately 40 percent to wholesale customers.

Water Sources

The primary drinking water source for Portland is the Bull Run watershed, supplemented by a groundwater supply from the Columbia South Shore Well Field (CSSWF) and potentially by wells in the former Powell Valley Road Water District (PVRWD). The Bull Run watershed is located approximately 30 miles east of Portland. The CSSWF is on the south shore of the Columbia River between the airport and Blue Lake Park; the former PVRWD is located in southeast Portland, west and north of Powell Butte.

Bull Run Watershed

The Bull Run watershed provides the majority of Portland's total water supply. The water of the Bull Run River is primarily impounded in reservoirs 1 and 2. Periodically, the Water Bureau relies on storage capacity in Bull Run Lake to enhance the supply of the two reservoirs.

Regulations Affecting the Use of Bull Run Water

Provisions of a 1997 U.S. Forest Service easement, the Safe Drinking Water Act (SDWA), the Endangered Species Act, and the Clean Water Act are the four regulations that primarily affect the use of Bull Run water.

The provisions of a **1997 easement with the U.S. Forest Service** restrict the available capacity of Bull Run Lake through requirements that create incentives to limit the volume available, the timing of use, and the mitigation requirements for releases that limit the lake's refill the following spring.

The **Surface Water Treatment Rule** (SWTR) of the SDWA and SWTR enhancements require the Water Bureau to meet specific, measurable water treatment standards related to turbidity and other contaminants. Modifications that the bureau has made to the water treatment regime and the bureau's ability to use the city's groundwater supply have enabled Portland to remain in compliance with the SWTR.

Under the **Endangered Species Act** (ESA), the Water Bureau is preparing a habitat conservation plan (HCP) that outlines how the bureau will avoid, minimize, or mitigate take of the four fish species that use the lower Bull Run River: the fall and spring races of Lower Columbia River Chinook salmon *(Oncorhynchus tshawytscha)*, Lower Columbia River coho salmon *(O. kisutch)*, Columbia River chum salmon *(O. keta)*, and Lower Columbia River

steelhead *(O. mykiss)* (Portland Water Bureau 2007c). Key proposals in the HCP that affect the bureau's management of the Bull Run water supply include measures to provide instream flows for fish in the lower Bull Run River. Under the proposed flow measures, the bureau will reduce the amount of Bull Run water that is diverted for municipal supply. This will increase the reliance on groundwater as a backup supply, especially during the period when the reservoirs are drawn down. The bureau plans to submit the HCP to the National Marine Fisheries Service in 2008.

The federal **Clean Water Act** (CWA) requires that states assess and regulate surface water quality according to the criteria outlined in the CWA. The Oregon Department of Environmental Quality (ODEQ) is responsible for monitoring water bodies according to the CWA. In a 2005 assessment called the Total Daily Maximum Load, ODEQ found the water in the lower Bull Run River (RM 0–RM 5.8) to be "water quality limited" with regard to the designated beneficial use as "core cold-water habitat" for salmonids. The Water Bureau has prepared a *Draft Temperature Management Plan* (TMP) for the lower Bull Run River. The TMP includes riparian forest protections, management measures for the temperature of the water, and measures to control the amount of flow released to the lower Bull Run River especially during the summer peak season. The TMP measures are included in the draft HCP. The TMP is anticipated to be submitted to ODEQ in 2008.

Hydrologic Limitations on Using Water from the Bull Run Watershed

The reservoirs in the Bull Run are recharged each year during the wet fall, winter, and spring. In the summer, when municipal water demand and releases into the lower Bull Run River are greater than the amount of water flowing into the reservoirs from tributaries and rain, the surface elevation of the reservoirs is drawn down. During this time, the city may use its groundwater supply to augment the water from the Bull Run. During a long, dry season, the city may have to increase the proportion of groundwater that it uses to meet demand before the return of fall rains.

The city is preparing for climate change through research and monitoring, revising long-term planning models, working with other west coast cities on adaptation and mitigation strategies, developing its rights in the CSSWF to provide summer supply and emergency backup capacity, and implementing water conservation practices and programs.

Reliability of the Bull Run Supply

An analysis of seasonal (June-October) reservoir supply data from 1946-2004 shows a declining trend for total reservoir inflow for these months. The city is monitoring inflow data to determine whether the trend will continue.

Columbia South Shore Well Field

The CSSWF is the second-largest developed water source in the state, and the largest developed groundwater source. The wells in the 11-square-mile well field provide water when the Bull Run supply is shut down due to emergency conditions such as turbidity events, landslides, fires, or human-caused disruptions. The groundwater system is also a supplemental supply when the Bull Run supply cannot provide enough water to meet demands during the summer peak season. Since 1985, the city has used groundwater from CSSWF 7 times when the Bull Run supply was shut down, and 12 times to augment the Bull Run supply during the summer season.

Demand Forecast

Using a single-equation econometric model, the Water Bureau has estimated the mathematical relationship between the overall demand for water and a series of explanatory variables including population change, weather factors such as precipitation and temperature, the average price of water, weekend use, and others. The result is a weather-normalized demand forecast for annual demand. The forecast also estimates demand under weather conditions that generated the highest average daily demand during the peak season (1967) and the highest single peak-day water demand (1981).

Although the growth in demand does not increase at the same rate as the growth in population, analysis of future demand and population shows that demand will increase over time. Figures ES-3 and ES-4 show forecasts for 2007-2030 of Portland's retail and wholesale annual average daily demand (ADD) for both weather-normalized and 1967 weather conditions for the entire year and for the peak season, respectively.

Population estimates were obtained from Metro. These forecasts were generated as a part of the population and allocation forecasts prepared for the Regional Transportation Plan. Estimates were made based on approximate service territories of Portland and each wholesale customer. No estimate for future growth outside the existing service territories was included, although some growth outside the existing service territory is likely for some providers as the UGB is expanded to accommodate the required 20-year land supply.

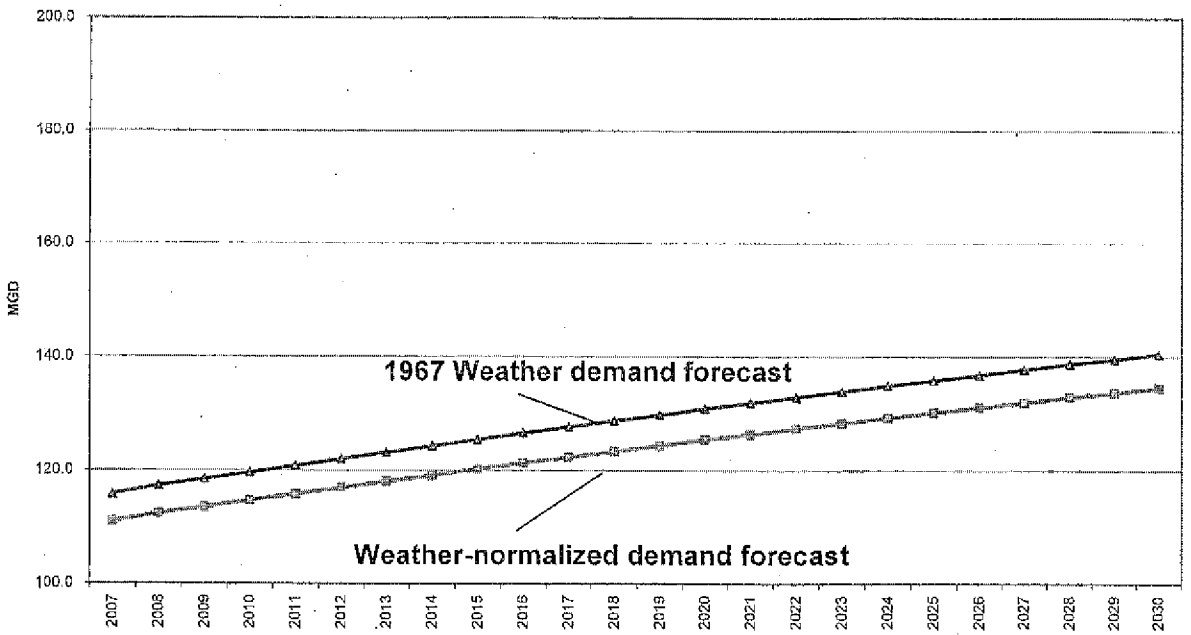


Figure ES-3. Total Annual Average Daily Demand Forecasts Under Weather-normalized and 1967 Weather Conditions, Calendar Years 2007-2030

Schedule and Budget for Development of New Water Rights

The amounts of the water supply will be developed over a 20-year period of time beginning in 2009 and progressing to 2028 at an estimated cost of $29.5 million (or approximately $750,000 per MGD). These estimates are in 2004 dollars. This $29.5 million does not include the cost for added infrastructure associated with pumping, pipeline upgrades, storage, or other distribution system costs not directly associated with the specific well sites.

The amounts for added infrastructure will be evaluated in future WMCP plan updates and revised as needed based on the following three elements:

- The factors associated with defining the amount of supply from the Powell Valley well system
- The amount of actual demand increments based on weather effects and conservation savings
- The status of wholesale contracting beyond the expiration of the first set of 10-year contracts as well as any new contracts that might be signed in the future

Increased costs will be defined for other infrastructure projects associated with pumping, transmission, and storage that may be necessary with an increased supply of groundwater from the CSSWF.

Conclusions Regarding the Need for Development of Groundwater Rights

This updated WMCP represents a continuation of Portland's commitment to proper management of its water resources. The Water Bureau relies on the well field for summer supply augmentation and as an emergency backup supply when the Bull Run surface water supply is unavoidably limited or unavailable. The well field infrastructure represents supply capacity already in place and ready to use. Other water-supply options of similar capacities will not be needed until demand (as moderated by conservation programs) grows enough to enable financing and construction of new storage or supply. Other major sources of supply that could make any further development of Bull Run storage unnecessary for a long time are being evaluated within the Portland region. Given uncertainties about future per capita demand, the pace of urban growth, future wholesale water customer behavior, requirements to provide instream flows for fish, and changes in weather or climate patterns that may reduce Bull Run yields during the peak season, the city anticipates a continuing need for the groundwater system to meet its responsibilities to its customers.

The city must plan and manage its resources in the most cost-effective manner possible. The development of four existing groundwater rights in the CSSWF would best leverage the existing infrastructure and subsurface hydrology, would create the least environmental impacts, and would meet vulnerability needs making it the most cost-effective and responsible option. The development of the groundwater source in the CSSWF can be done incrementally as needed and as fits with actual water demand, future wholesale contracting, conservation program success, and the development of non-potable supplies over time. For these reasons, continuing to use the groundwater system as backup supply and developing the conservation programs are the methods of choice for meeting future needs.

and with the continued status of the Bull Run as an unfiltered supply. The development of groundwater supplies is considered more cost-effective than these alternatives.

Additional conservation programs will be evaluated as a part of pilot programs (particularly non-potable sources either as a part of source-switching or at the individual user level).

Water sources not within the control of the City of Portland such as Columbia, Willamette, and Clackamas Rivers have also been evaluated. These sources are not considered viable sources to meet either reliability needs or growth needs for summer supplies for reasons of cost, water quality, or availability. The city anticipates continuing to supply wholesale customers in the future. The city is not assuming reduced consumption based on reduced future sales even if the current set of wholesale customers were to change in the future. In fact, reliance on Portland supplies in some basins (e.g. the Clackamas) could reduce the need to develop more environmentally sensitive sources of supply.

Because of the current need to focus on reinvestment in the city's older infrastructure system and the possibility of needing to address new Safe Drinking Water Act regulations, the Water Bureau has prioritized the limited public resources available to it to address these issues. The city needs to invest in sufficient groundwater resources to address annual average water demands while at the same time reinvesting in the system, and continuing its strong commitment to sustainable and efficient water use practices.

5.6 Undeveloped, Expanded, and New Water Rights

This subsection addresses the requirements of OAR 690-086-0170 [6]: If any expansion or initial diversion of water allocated under existing permits is necessary to meet the needs shown in (3), a quantification of the maximum rate and monthly volume of water to be diverted under each of the permits.

The City of Portland is requesting additional water in the amount under existing permits for the Columbia South Shore Well Field for the next 20 years, from the present to 2028. The request is to develop an additional 48.54 MGD/53.39 maximum MGD of supply from the CSSWF water rights shown in Table 5-9.

Table 5-9. Requested Groundwater Supplies by Permit, to 2028

Permit #	Monthly Volume[a] (in BG)	Millions of Gallons a Day	Maximum Diversion Rate[b] (in MGD)
G-10124 & G-10455	.54	17.84	19.62
G-8755 & G-10479	.92	30.7	33.77
Totals	1.46	48.54	53.39

[a]30–90-day supply based on 30 days of pumping

[b]The maximum diversion rate is a 10 percent increase of the monthly volume to represent the capacity yield for a less-than-30-day pumping event.

The basis for the 48.54 MGD of additional supply comes from the materials presented in the supply and demand analysis (subsection 5.4). This total is accounted for in Table 5-10 below.

Tab 4

Oregon Administrative Rule 340-041-0340

"Beneficial Uses to Be Protected in the Willamette Basin

(1) Water quality in the Willamette Basin (see Figure 1) must be managed to protect the designated beneficial uses shown in Table 340A (August 2005).

(2) Designated fish uses to be protected in the Willamette Basin are shown in Figures 340A (November 2003) and 340B (August 2005)."

Table 340A attached

The Oregon Administrative Rules contain OARs filed through June 13, 2008

DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER POLLUTION

DIVISION 41

WATER QUALITY STANDARDS: BENEFICIAL USES, POLICIES, AND CRITERIA FOR OREGON

Basin-Specific Criteria (Willamette)

340-041-0340

Beneficial Uses to Be Protected in the Willamette Basin

(1) Water quality in the Willamette Basin (see Figure 1) must be managed to protect the designated beneficial uses shown in Table 340A (August 2005).

(2) Designated fish uses to be protected in the Willamette Basin are shown in Figures 340A (November 2003) and 340B (August 2005).

[ED. NOTE: Tables referenced are available from the agency.]

Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048
Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048
Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03; DEQ 2-2007, f. & cert. ef. 3-15-07

340-041-0344

Table 340A

Designated Beneficial Uses
Willamette Basin
(340-041-0340)

Beneficial Uses	Willamette River Tributaries						Main Stem Willamette River			
	Clackamas River	Molalla River	Santiam River	McKenzie River	Tualatin River	All Other Streams & Tributaries	Mouth to Willamette Falls, Including Multnomah Channel	Willamette Falls to Newberg	Newberg to Salem	Salem to Coast Fork
Public Domestic Water Supply[1]	X	X	X	X	X	X	X	X	X	X
Private Domestic Water Supply[1]	X	X	X	X	X	X	X	X	X	X
Industrial Water Supply	X	X	X	X	X	X	X	X	X	X
Irrigation	X	X	X	X	X	X	X	X	X	X
Livestock Watering	X	X	X	X	X	X	X	X	X	X
Fish & Aquatic Life[2]	X	X	X	X	X	X	X	X	X	X
Wildlife & Hunting	X	X	X	X	X	X	X	X	X	X
Fishing	X	X	X	X	X	X	X	X	X	X
Boating	X	X	X	X	X	X	X	X	X	X
Water Contact Recreation	X	X	X	X	X	X	X[3]	X	X	X
Aesthetic Quality	X	X	X	X	X	X	X	X	X	X
Hydro Power	X	X	X	X	X	X	X	X		
Commercial Navigation & Transportation							X	X	X	

[1] With adequate pretreatment and natural quality that meets drinking water standards.
[2] See also Figures 340A and 340B for fish use designations for this basin.
[3] Not to conflict with commercial activities in Portland Harbor.

Table produced August, 2005

Tab 5

Memorandum: Application of Oregon Administrative Rule 340-041-0340

MEMORANDUM

July 14, 2008

TO: LWG EXECUTIVE COMMITTEE

FROM: LWG LEGAL COMMITTEE

RE: APPLICATION OF OREGON ADMINISTRATIVE RULE 340-041-0340

Table 340A includes "public domestic water supply" and "private domestic water supply" among designated beneficial uses of the main stem Willamette River from the mouth to Willamette Falls.

Raw water from discrete samples from the river does not represent an exposure point concentration under this drinking water scenario. Even if water were drawn from the Willamette River for potable water, the water would be treated according to state and federal standards before it was made available for domestic use. The State of Oregon general designations for domestic water supply uses (Table 340A) are qualified by a footnote that reads, "*with adequate pretreatment and natural quality that meets drinking water standards.*" Oregon rules set forth the adequate pretreatment that is required, all focused on the quality of the water delivered after treatment to the user. OAR 333-061-0025 et seq.

Water suppliers must take "all reasonable precautions" to assure that water delivered to water users does not exceed maximum contaminant levels (MCLs). OAR 333-061-0025. The water supplier must install and use specified treatment technologies to attain MCLs. OAR 333-061-0045(6). OAR 333-061-0050(4)(b) specifies packed tower aeration or granular activated carbon as best available technologies for most volatile organic and organic chemicals and a variety of other techniques (e.g. coagulation/filtration, ion exchange, reverse osmosis) as best available technologies for inorganic chemicals. *See also*, 40 C.F.R. 142.62(a)-(c).

Based upon these rules, "with adequate pretreatment" means compliance with OAR 333-061-045(6)'s requirement to employ the identified best available technologies. Thus, in-stream water quality in the Lower Willamette would only fail to support the designated beneficial uses if drinking water quality could not be achieved with use of the best available technologies.

Tab 6

OAR 340-041-0340, Table 121A (Designated Beneficial Uses Mainstem Snake River)
(compare to Tab 4)

Table 121A

Designated Beneficial Uses
Mainstem Snake River
(340-41-0120)

Beneficial Uses	Snake River RM 176 to 409
Public Domestic Water Supply[1]	X
Private Domestic Water Supply[1]	X
Industrial Water Supply	X
Irrigation	X
Livestock Watering	X
Fish & Aquatic Life[2]	X
Wildlife & Hunting	X
Fishing	X
Boating	X
Water Contact Recreation	X
Aesthetic Quality	X
Hydro Power	X
Commercial Navigation & Transportation	X

[1] With adequate pretreatment and natural quality that meets drinking water standards.

[2] See also Table 121B for fish use designations for this river.

Table produced August, 2005

Tab 7

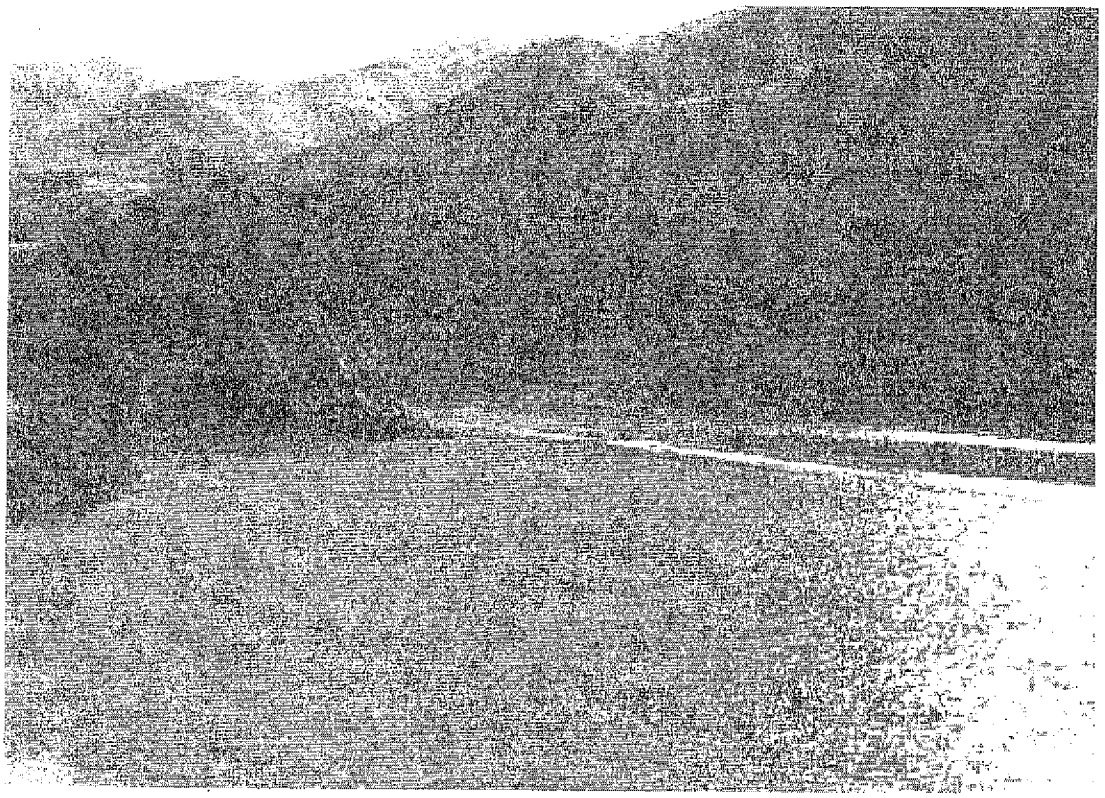
Excerpt, Snake River – Hells Canyon TMDL, Submitted - July 2003, Revised – June 2004

TMDL approved by the U.S. Environmental Protection Agency (EPA) on March 1, 2004

"Waters designated as domestic water supply (including irrigation water and livestock watering) within the SR-HC TMDL reach are required meet general surface water quality standards for toxic materials and turbidity. These waters, while not required to meet drinking water standards in-stream, must be of sufficient quality that it is possible for them to meet drinking water standards with conventional treatment measures." (Page 71)

Note: This statement was re-iterated verbatim in the revised edition of Snake River – Hells Canyon TMDL, June 2004 (*Revised TMDL approved by the U.S. Environmental Protection Agency (EPA) on September 9, 2004)*

Snake River - Hells Canyon
Total Maximum Daily Load (TMDL)



Submitted - July 2003
Revised - June 2004

Prepared by:

Idaho Department of Environmental Quality
Boise Regional Office
1445 North Orchard
Boise, Idaho 83706

Oregon Department of Environmental Quality
Pendleton Office
700 SE Emigrant, Suite 330
Pendleton, Oregon 97801

Table 2.2.3 b Oregon segment-specific listings for the Snake River - Hells Canyon TMDL reach.

Segment	Oregon 303(d) Listed Pollutants	Oregon Designated Beneficial Uses
Snake River: RM 409 to 395 Upstream Snake River (Owyhee Basin)	Mercury, temperature	public/private domestic water supply industrial water supply irrigation water, livestock watering salmonid rearing and spawning* (trout) resident fish (warm water) and aquatic life water contact recreation wildlife and hunting fishing, boating, aesthetics
Snake River: RM 395 to 335 Upstream Snake River to Farewell Bend (Malheur Basin)	Mercury, temperature	public/private domestic water supply industrial water supply irrigation water, livestock watering salmonid rearing and spawning* (trout) resident fish (warm water) and aquatic life water contact recreation wildlife and hunting fishing, boating, aesthetics
Snake River: RM 335 to 260 Brownlee Reservoir Oxbow Reservoir Upper half of Hells Canyon Reservoir (Powder Basin)	Mercury, temperature	public/private domestic water supply industrial water supply irrigation water, livestock watering salmonid rearing and spawning* resident fish and aquatic life water contact recreation wildlife and hunting fishing, boating, aesthetics hydropower
Snake River: RM 260 to 188 Lower half of Hells Canyon Reservoir Downstream Snake River (Grande Ronde Basin)	Mercury, temperature	public/private domestic water supply industrial water supply irrigation water, livestock watering salmonid rearing and spawning* (downstream) resident fish and aquatic life water contact recreation wildlife and hunting fishing, boating, aesthetics anadromous fish passage commercial navigation and transport

* The designation of salmonid spawning for both Idaho and Oregon specifies that this designation applies only when and where salmonids are present and spawning. Salmonid spawning within these drainage basins is most likely to occur within the tributaries to the SR-HC TMDL reach where flow and substrate conditions are favorable to support such uses. Therefore, the salmonid spawning beneficial use designation and its accompanying water quality criteria apply to those tributaries so designated. As these tributaries are not interstate waters, and salmonid spawning use support is a localized habitat issue, state-specific criteria for salmonid spawning will apply to those areas of the tributaries designated for salmonid spawning.

2.2.2.2 Descriptions of Designated Uses

Aquatic life

Aquatic life classifications are for waterbodies that are suitable or are intended to be made suitable for protection and maintenance of viable aquatic life communities of aquatic organisms and populations of significant aquatic species. Aquatic life uses include the following official Oregon and/or Idaho designated beneficial uses:

- cold water aquatic life
- salmonid rearing and spawning

Boating (RM 409 to 188).
Waters with this designation within the SR-HC TMDL reach are required to meet all criteria for the support of boating particularly those for bacteria and nuisance algal growth.

Water Supply
Water supply classifications are for waterbodies that are suitable or are intended to be made suitable for agriculture, domestic and industrial uses. Industrial water supply includes hydropower uses where designated. Water supply uses include the following official Oregon and/or Idaho designated beneficial uses:

- public/private domestic water supply
- agricultural water supply (including irrigation water and livestock watering)
- industrial water supply
- hydropower generation
- commercial navigation and transportation

Public/Private Domestic Water Supply (RM 409 to 188).
Waters designated for domestic water supply within the SR-HC TMDL reach are required to meet general surface water quality standards for toxic materials and turbidity. These waters, while not required to meet drinking water standards in-stream, must be of sufficient quality that it is possible for them to meet drinking water standards with conventional treatment measures.

Agricultural Water Supply (RM 409 to 188).
Waters designated as agricultural water supply (including irrigation water and livestock watering) within the SR-HC TMDL reach are required to be suitable for the irrigation of crops or as drinking water for livestock. Waters designated for agricultural water supply are required to meet general surface water quality criteria for toxic materials. These waters are also required to meet narrative criteria related to sediment and excessive nutrients.

Industrial Water Supply (RM 409 to 188).
Waters designated as industrial water supply are required to be suitable for industrial uses. Waters designated for industrial water supply within the SR-HC TMDL reach are required to meet general surface water quality criteria.

Hydropower Generation (RM 335 to 260).
No hydropower facilities are located in the Upstream (RM 409 to RM 335) or Downstream (RM 247 below Hells Canyon Dam to RM 188) Snake River segments of the SR-HC TMDL reach (see Section 2.3 for a more detailed discussion of these segments) but the flows into the SR-HC TMDL reach are regulated by upstream and tributary hydropower and irrigation developments. Brownlee, Oxbow, and Hells Canyon Dams are located within the SR-HC TMDL reach and are operated for hydropower generation. These three facilities are collectively referred to as the Hells Canyon Complex (HCC).

Brownlee Reservoir was constructed primarily for power production although it is also operated for flood control purposes through direction from the US Army Corps of Engineers. The reservoir is also currently operated with consideration for anadromous fish protection and passage in the downstream reaches of the Snake and Columbia rivers under consultation with NMFS. Brownlee Reservoir provides the flows from the Hells Canyon Complex for fish

Tab 8

Excerpts, National Primary Drinking Water Regulations 40 CFR Part 141

§ 141.3 Coverage.

"This part shall apply to each public water system, unless the public water system meets all of the following conditions:

(a) Consists only of distribution and storage facilities (and does not have any collection and treatment facilities);

(b) Obtains all of its water from, but is not owned or operated by, a public water system to which such regulations apply:

(c) Does not sell water to any person; and

(d) Is not a carrier which conveys passengers in interstate commerce."

§ 143.2 Definitions.

* * * * *

"Public water system means a system for the provision to the public of water for human consumption through pipes or, after August 5, 1998, other constructed conveyances, if such system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year. Such term includes: any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Such term does not include any "special irrigation district." A public water system is either a "community water system" or a "noncommunity water system.""

§ 141.23 Inorganic chemical sampling and analytical requirements.

"Community water systems shall conduct monitoring to determine compliance with the maximum contaminant levels specified in §141.62 in accordance with this section. Non-transient, non-community water systems shall conduct monitoring to determine compliance with the maximum contaminant levels specified in §141.62 in accordance with this section. Transient, non-community water systems shall conduct monitoring to determine compliance with the nitrate and nitrite maximum contaminant levels in §§141.11 and 141.62 (as appropriate) in accordance with this section.

(a) Monitoring shall be conducted as follows:

(a) Monitoring shall be conducted as follows:

*****

(2) Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a sampling point) beginning in the initial compliance period. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

Note: For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources."

(a) Monitoring shall be conducted as follows:

*****

(2) Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a sampling point) beginning in the initial compliance period. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

Note: For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources."

Tab 8 con't.

Tab 9

Memorandum: City of Wilsonville Willamette River Water Treatment Plant

MEMORANDUM

July 14, 2008

TO: LWG EXECUTIVE COMMITTEE

FROM: LWG LEGAL COMMITTEE

RE: CITY OF WILSONVILLE WILLAMETTE RIVER WATER TREATMENT PLANT

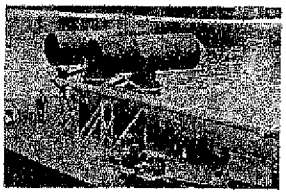
The City of Wilsonville treats Willamette River water for public water supply in a multiple step process. A description of the step by step process is attached.

First, screens at the intake pipes protect fish and keep out large debris. Then, the water is processed through enhanced sedimentation, ozonation, and granular activated carbon before final polishing through a sand filter and secondary disinfection. The intake screens would typically be a requirement to obtain the water right. The enhanced sedimentation, filtration and disinfection all appear to be standard technologies required of all water supply systems with a surface water source under OAR 333-061-0032. Ozonation and granular activated carbon are defined as best available technologies for organic and inorganic chemicals in 40 C.F.R. §142.62. Thus, the Wilsonville plant doesn't appear to rely upon extraordinary treatment technologies

The treatment facility is "over-designed" in the sense that drinking water standards can be met without such extensive treatment. Nonetheless, the plant is operated using all steps at all times - - whether or not they are all needed to meet drinking water standards. In addition, the treatment plant has redundant (i.e., back-up) systems for all these processes.

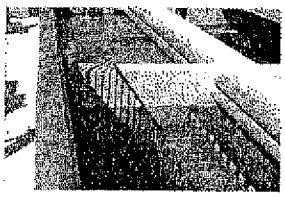
Here's a brief description of the "step-by-step" process used in Wilsonville's multi-barrier water treatment facility.

Intake Screens



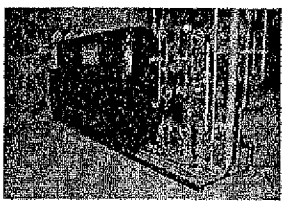
The intake screens protect fish and prevent debris from entering the treatment facility. The screens are located off the bottom of the river (to avoid bringing sediments into the treatment plant) and below the surface (to avoid bringing oils or other floating material into the treatment plant). The openings in these screens are approximately the diameter of a toothpick.

Enhanced Sedimentation



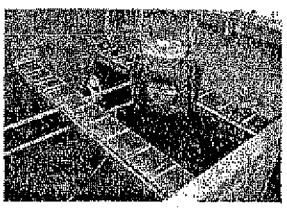
Enhanced Sedimentation to remove materials that are small enough to pass through the intake screens. Conventional chemicals called coagulants cause the suspended materials to adhere to one another forming larger, heavier "floc" which settles out of the water. By adding very fine sand to the mixture, the weight of the "floc" is increased thereby causing the settling process to occur more quickly and more completely than conventional water treatment. The sand is then cleaned, recycled and reused.

Ozonation



Ozonation serves multiple functions including disinfection(to kill bacteria, viruses, Giardia, Cryptosporidium); breakdown of organic chemicals; breakdown of taste/odor causing compounds; and enhanced removal of organic material by the filters. After bubbling through the water, the ozone quickly decomposes into harmless oxygen gas.

GAC

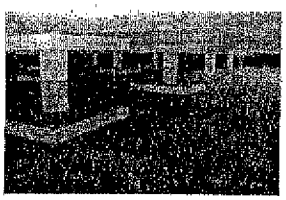


Granular Activated Carbon charcoal filters (6 feet thick) further remove turbidity and pathogens; remove organic chemicals; and remove taste/odor compounds to assure consistently high quality of the treated water.

Sand Filter

The Sand Filter is a "polishing" step to improve particle removal.

Secondary Disinfection



Secondary Disinfection adds chlorine to prevent bacterial contamination as the treated water flows through the distribution system to customers.

Water Quality Analysis

The following Water Quality Comparison Table lists the quality of Wilsonville's treated water in relation to drinking water standards established by the U.S. Environmental Protection Agency.

Further information about EPA drinking water standards can be found on the EPA's website: www.epa.gov/safewater

Public Works Staff
503-682-4092
Monday thru Friday
7:30 a.m. to 4:30 p.m.

After hours emergency:
1-866-252-3614

Water FAQs
Citizen Request Form
Willamette River Water Quality Study (2003)
June 30th, 2004 Water Quality Forum Findings

Tab 10

Memorandum from Laura Kennedy investigating Relevance and Appropriateness of MCLs at other EPA sediment sites

14 July 2008

Memorandum

To: LWG Management Team

From: Kennedy/Jenks Consultants

Subject: Contact with National Experts

Kennedy/Jenks was asked to contact people with sediment site expertise. This memo summarizes our communications.

Todd Bridges, U.S. Army Corps of Engineers, Engineering Research and Development Center, Vicksburg, MS.

- Does not know of any urban freshwater superfund site for which MCLs were used as ARARs where there is no current or anticipated municipal use for drinking water.
- Does not know of any freshwater superfund site where the human ingestion of freshwater bivalves was included as a complete exposure scenario quantified in the human health risk assessment.

Danny Reible, Professor and Chair of the Department of Civil Engineering, University of Texas at Austin (Served on National Research Council committees on effectiveness of dredging contaminated sediments and on remediation of PCB-contaminated sediments)

- Does not know of any freshwater sediment site where drinking water scenarios or MCLs were applied.
- Does not know of any sites where human consumption of freshwater clams was considered.

Donna Vorhees, Science Collaborative (Served on National Research Council committee on effectiveness of dredging contaminated sediments)

- Does not know of any urban freshwater sediment sites where drinking water scenarios or MCLs were applied.
- Does not know of any sites that have included human consumption of freshwater clams. She said that the question has come up, but there has been no evidence of consumption.

Marc Greenberg, U.S. EPA, Environmental Response Team. (He supports the Superfund program and his primary areas of focus are contaminated sediment sites and the evaluation of ground water-surface water interactions and their relevance to exposure and risk)

- Does not know of any urban freshwater superfund site for which MCLs were used as ARARs where there is no current or anticipated municipal use for drinking water.
- Does not know of any freshwater sediment sites where human consumption of freshwater clams was considered. Does know of marine/estuarine sites where this scenario was considered.